

ABSTRACT OF THE DISCLOSURE

Compositions, methods, kits, and apparatus are provided for delivering a macromolecular assembly such as a plasmid, virus vector, or other gene vector, to an
5 extravascular tissue such as muscle tissue. The composition comprises the macromolecular assembly and a vascular permeability-enhancing agent. In another embodiment, the composition further comprises a vasodilating agent. The method of the invention comprises providing a vascular permeability-enhancing agent to a blood vessel and providing a
10 macromolecular assembly to the vessel. An oxygenator useful for providing oxygen to a fluid extracorporeally prior to providing the fluid to a blood vessel of a mammal is included in the invention. Kits, apparatus, and methods for using the catheters described herein for isolating cardiac circulation, diverting caval blood flow from the right atrium, and for other purposes, are also described.

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